

**Claims**

1. A dry distillation and volume reduction apparatus for waste, comprising:

a superheated steam generator for generating a superheated steam;

a dry distillation and volume reduction vessel for heating and subjecting the waste to dry distillation and volume reduction using the superheated steam supplied from the superheated steam generator; and

a heating gas supplier for supplying an exhaust gas of an engine as a heat source for heating the superheated steam generator.

2. The dry distillation and volume reduction apparatus for waste according to claim 1, further comprising a drier for drying in advance the waste to be supplied to the dry distillation and volume reduction vessel.

3. The dry distillation and volume reduction apparatus for waste according to claim 2, wherein the drier includes a cyclone-type composite flow drier having a conical container which narrows downward, a hot flow supplier for supplying a hot flow along the inner peripheral surface of the conical container, and a waste transporter for transporting the waste along the inner peripheral surface of the conical container.

4. The dry distillation and volume reduction apparatus for waste according to claim 2, wherein the drier includes a rotary drier having an inclined rotary cylinder provided with a sweeping blade for sweeping the waste upward and hot flow supplier for supplying a hot flow into the inclined rotary cylinder.

5. The dry distillation and volume reduction apparatus for waste according to claim 3 or 4, wherein exhaust gas led out from the superheated steam generator is used as a heat source for heating the hot flow supplier.

6. The dry distillation and volume reduction apparatus for waste according to claim 3 or 4, wherein high-temperature gas led out from the dry distillation and volume reduction vessel is used as a heat source for heating of the hot flow supplier.

7. The dry distillation and volume reduction apparatus for waste according to any of claims 1 to 6, further comprising a crusher for crushing in advance the waste supplied to the dry distillation and volume reduction vessel.

8. The dry distillation and volume reduction apparatus for waste according to any of claims 1 to 7, wherein the superheated steam generator is provided with a feed tube for warm water led out from the cooling water system of an engine and the superheated steam is generated by heating the warm water passing through the feed tube.

9. The dry distillation and volume reduction apparatus for waste according to any of claims 1 to 8, wherein the superheated steam generator is provided with a burner serving as a heater for the superheated steam generator.

10. The dry distillation and volume reduction apparatus for waste according to any of claims 1 to 9, further comprising a reflux unit for reusing the superheated steam supplied to the dry distillation and volume reduction vessel as a heat source for heating for the superheated steam generation by refluxing the superheated steam to the superheated steam generator.

11. The dry distillation and volume reduction apparatus for waste according to claim 9 or 10, wherein combustible components recovered from the dry distilled gas generated during dry distillation and volume reduction of the waste by the dry distillation and volume reduction vessel are used as a fuel for the burner.

12. The dry distillation and volume reduction apparatus for waste according to any of claims 9 to 11, wherein carbides produced during dry distillation and volume reduction of the waste by the dry distillation and volume reduction vessel are supplied into the superheated steam generator and burned by the burner.

13. The dry distillation and volume reduction apparatus for waste according to any of claims 1 to 12, wherein exhaust gases

of an engine serving as a driving source of a power generator are used as a heat source for heating the superheated steam generator.

14. The dry distillation and volume reduction apparatus for waste according to any of claims 1 to 13, wherein a portion of superheated steam generated by the superheated steam generator is supplied to a turbine power generator to drive the turbine power generator.

15. A dry distillation and volume reduction apparatus for waste, comprising:

a superheated steam generator for generating a superheated steam;

a dry distillation and volume reduction vessel for heating and subjecting the organic waste to dry distillation and volume reduction using the superheated steam supplied from the superheated steam generator; and

a heating gas supplier for supplying combustible gas generated by incomplete combustion of carbides produced in the dry distillation and volume reduction vessel as a heat source for heating the superheated steam generator.

16. The dry distillation and volume reduction apparatus for waste according to claim 15, wherein waste oil is added to the carbides to induce the incomplete combustion.

17. The dry distillation and volume reduction apparatus for waste according to any of claims 1 to 16, wherein a low-pressure

superheated steam under a pressure of no less than the normal pressure which has been superheated to a temperature of 250 to 500°C under the normal pressure in the superheated steam generator is supplied to the dry distillation and volume reduction vessel and the waste is pyrolyzed in an oxygen-free or low-oxygen atmosphere.

18. The dry distillation and volume reduction apparatus for waste according to any of claims 1 to 17, comprising a separation and recovery unit for separating and recovering useful components from the dry distilled gas produced during dry distillation and volume reduction by the dry distillation and volume reduction vessel.

19. The dry distillation and volume reduction apparatus for waste according to any of claims 1 to 18, wherein the superheated steam generator and the dry distillation and volume reduction vessel are integrated.

20. The dry distillation and volume reduction apparatus for waste according to any of claims 1 to 18, wherein the superheated steam generator, dry distillation and volume reduction vessel, and heating gas supplier are installed on a vehicle load-carrying platform.